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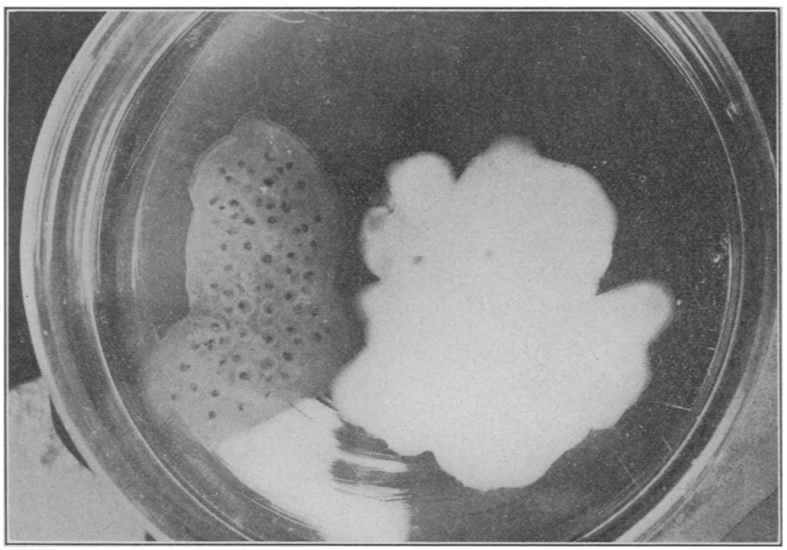
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A MILKY WHITE AMPHIBIAN EGG JELL.

ARTHUR M. BANTA AND ROSS AIKEN GORTNER.

While collecting *Ambystoma punctatum* eggs in April, 1914, the writers found a freshly-laid bunch which had jell of milky whiteness instead of being transparent. The white clutch of eggs was conspicuous among the others even though the jell had as yet swelled very little and the bunch was quite small. The eggs were still undivided. They had the normal amount of pigment. The jell was so clouded that at first no eggs could be seen in the mass without breaking into the jell. The jell imbibed water and the egg bunch soon assumed the normal proportions for the



clutch of this species. The photograph shows the relative opacity of the white bunch and a normal bunch of eggs of the same age. Only a few eggs were visible in the opaque bunch when the photograph was taken while one could readily see the bottom of the dish through the jell of the normal bunch. The individual outer and inner egg membranes in the white bunch were of normal transparency. This is indicated indistinctly

in the photograph by the somewhat more transparent spots, in which were eggs, near the edges of the white bunch.

When just ready to hatch the embryos with their egg membranes were removed from the jell, care being taken to remove all traces of eggs which had died during development. The water was carefully drained off and the jell was dried in a porcelain dish over a water bath. The jell from a normal egg bunch of the same stage of development was treated in a similar manner. After drying on the water bath the jell was further desiccated in a vacuum desiccator over sulfuric acid.

233 grams of normal egg jell yielded 0.7855 grams or 0.337 per cent. of dry material.

294 grams of the opaque jell yielded 1.060 grams or 0.361 per cent. of dry material.

It thus appears that the jell which normally surrounds these eggs contains about 99.6 per cent. of water and yet this jell is fairly tough and resistant and admirably suited to supporting the eggs in such a position as to permit ready diffusion of oxygen and carbon dioxide and to protect the eggs from mechanical injury.

The two jells when desiccated were indistinguishable. A portion of each was again placed in water and in a short time they had imbibed enough water to resume their former appearance, the one becoming milky white and the other transparent. It may perhaps be germane to add that the milky appearance could not be ascribed to bacteria inasmuch as the egg mass was found shortly after being deposited and also because there was no evidence of bacterial decomposition up to the time the drying was begun.

Thinking that perhaps the milky color was produced by an admixture of albumen with the mucin (which composes the normal egg jell) nitrogen determinations were made of both abnormal and normal egg jells.

The nitrogen was determined by Kjeldahl's method.

Normal egg jell.—0.2060 gram gave 12.3 c.c. 0.1 normal NH_4OH; 0.3564 gram gave 21.1 c.c. 0.1 normal NH_4OH, indicating 8.36 per cent. and 8.29 per cent. respectively or an average of 8.32 per cent. of nitrogen in the normal egg jell.

Opaque egg jell.—0.2764 gram gave 18.3 c.c. 0.1 normal NH_4OH; 0.3540 gram gave 23.0 c.c. 0.1 normal NH_4OH, indicating 9.27 per cent. and 9.09 per cent. respectively or an average of 9.18 per cent. of nitrogen in the opaque egg jell.

Almost no chemical work has been done with the amphibian egg jells aside from the observation that the nitrogen content is low due to the presence of a carbohydrate nucleus. Of course the above results do not give the true nitrogen content of the egg jell for they should have been corrected for ash content, but this was not possible due to lack of material. The figures do show, however, that the jells differ chemically as well as in appearance, and that the difference in nitrogen content is in the same direction and of almost precisely the same amount that it would be if the opaque appearance were produced by an admixture of albumen (nitrogen = 15 per cent.–16 per cent.) with the normally occurring mucins.

STATION FOR EXPERIMENTAL EVOLUTION,
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